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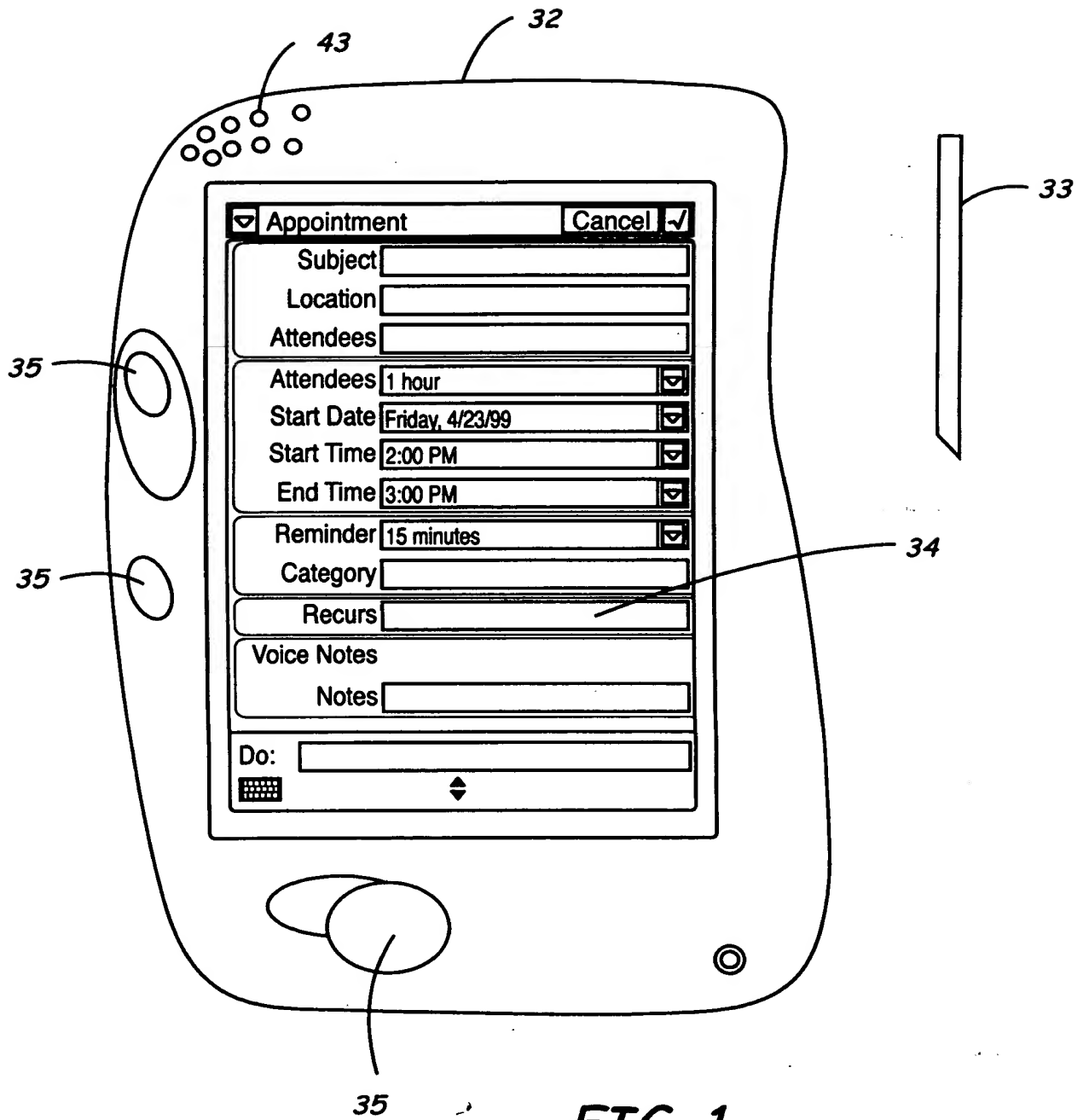


FIG. 1

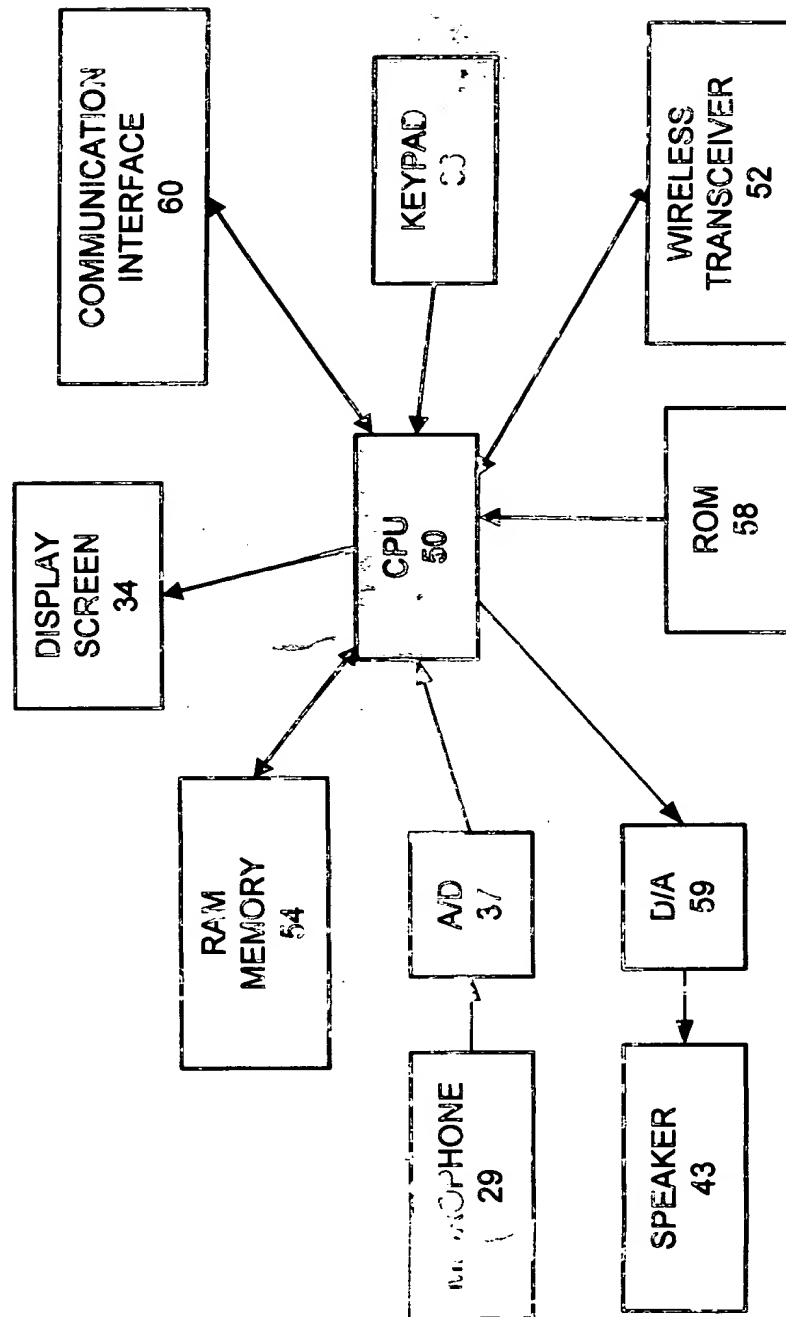
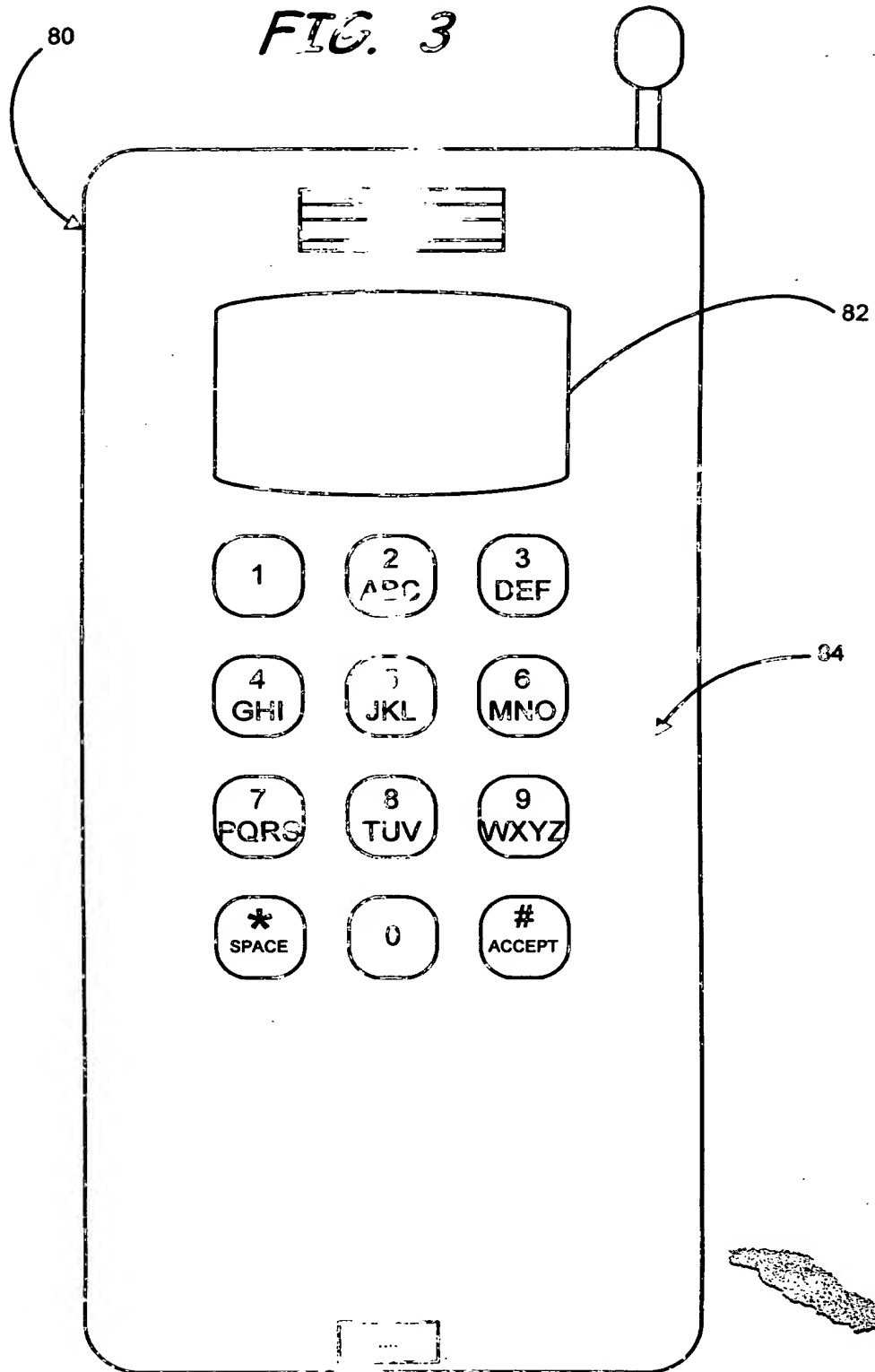


FIG. 2

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FIG. 3



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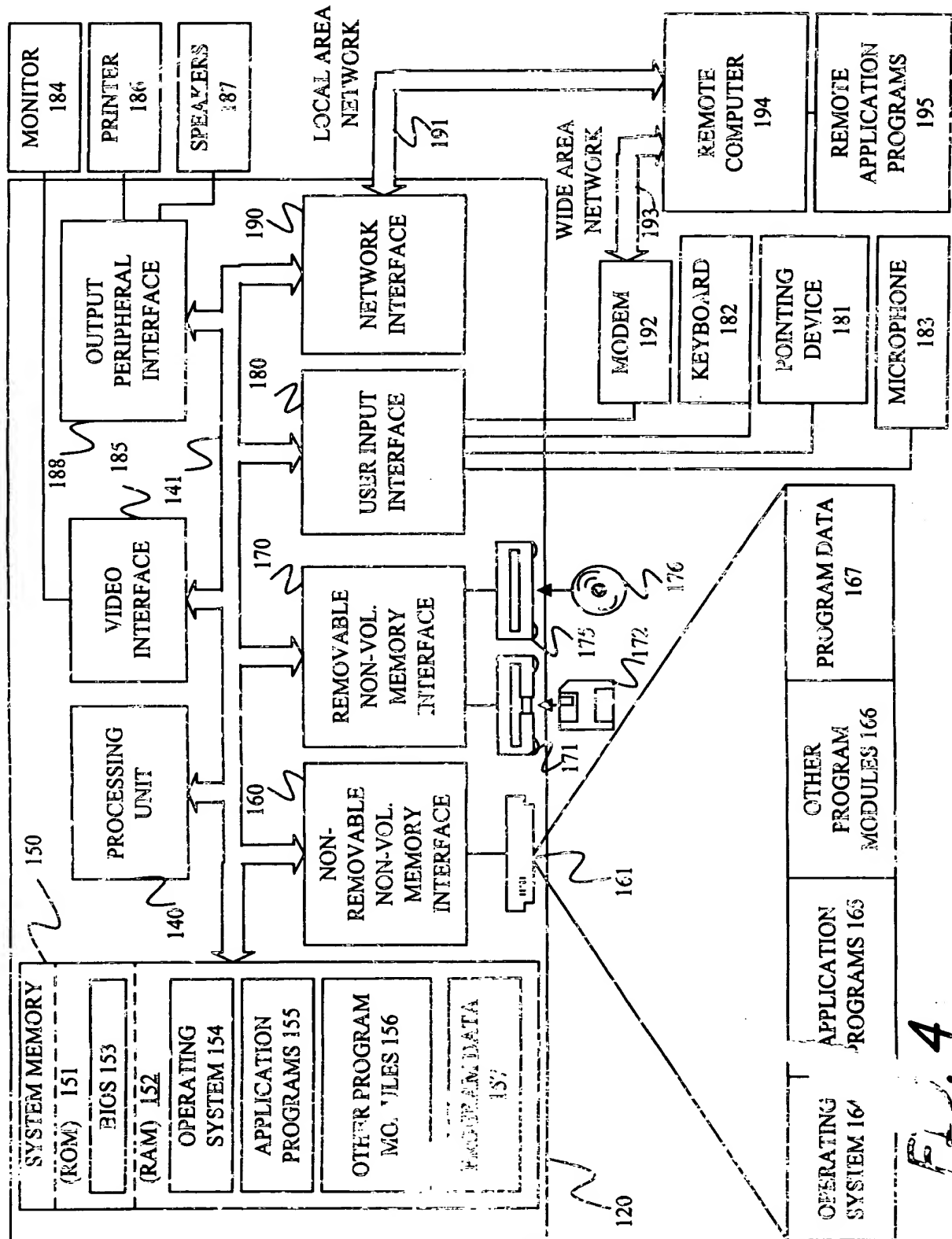
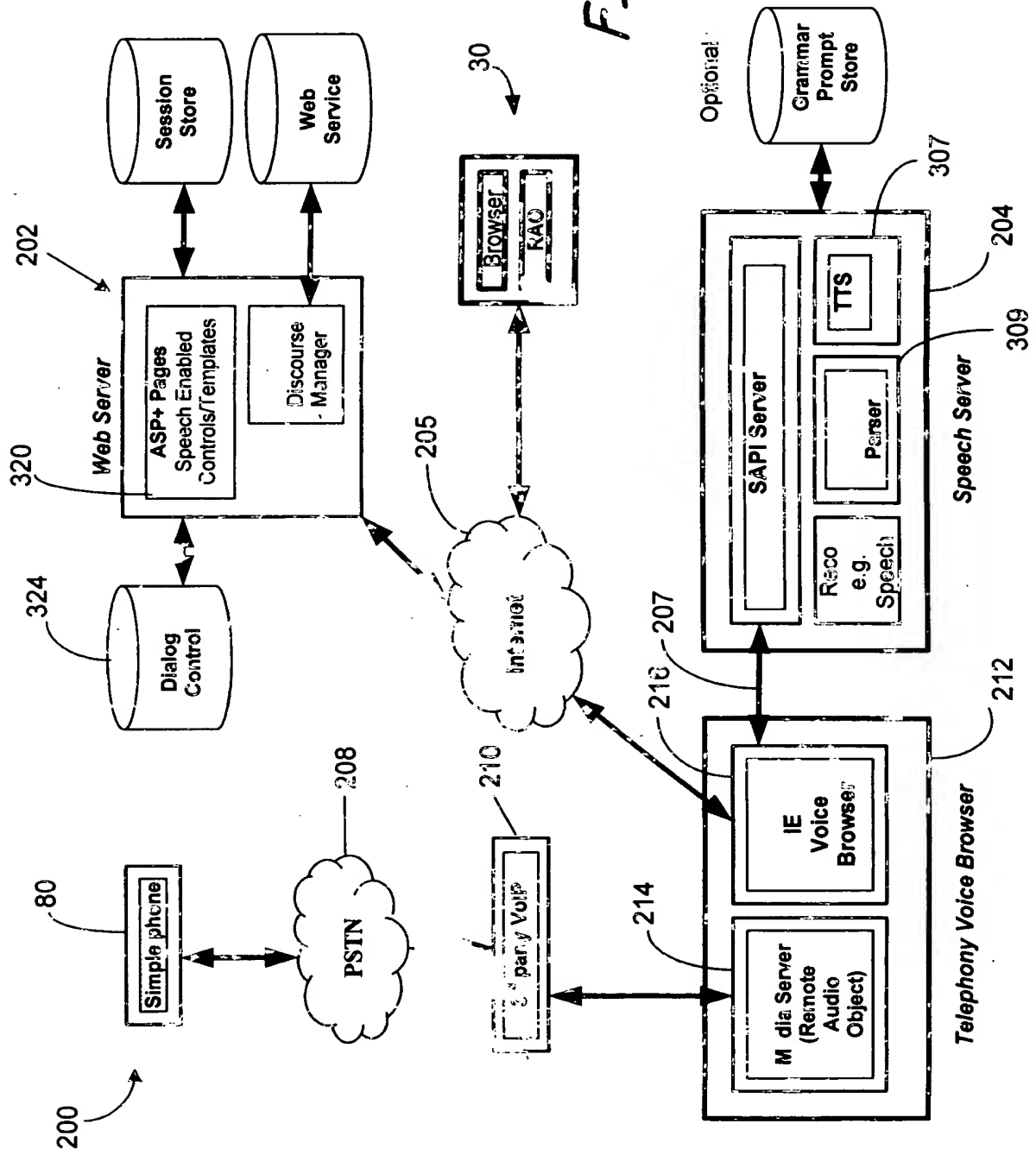


FIG. 4

FIG. 5



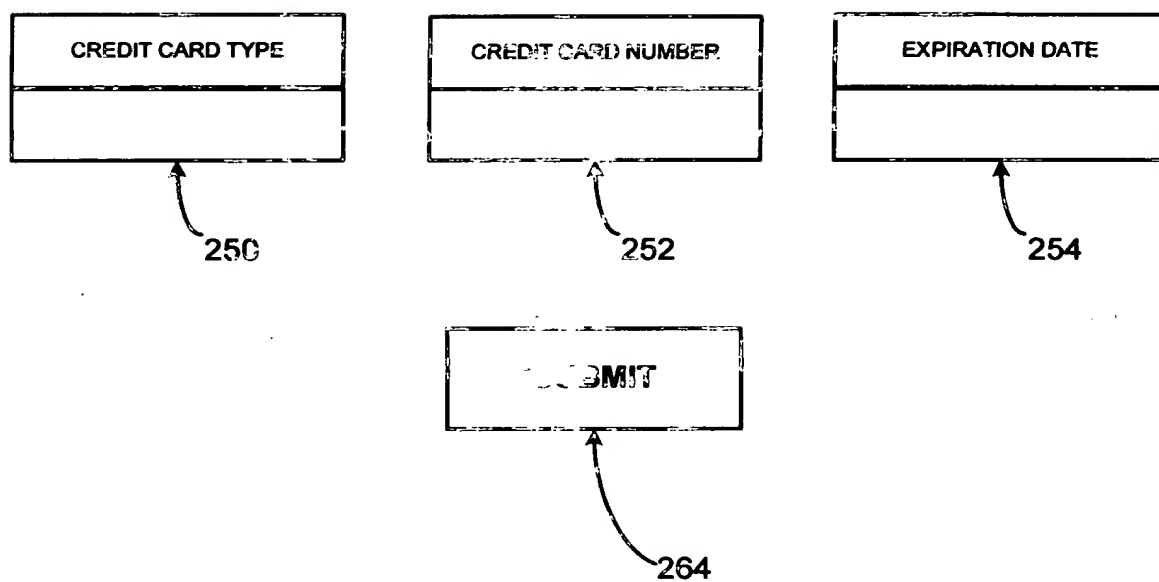


FIG. 6

```

<html>
  <form id="get_card_info" method="post" action="http://payment.asp">
    <select name="card_type">
      <option value="amex">American Express</option>
      <option value="visa">Visa</option>
      <option value="ms">MasterCard</option>
    </select>
    <input type="text" name="card_num" width="30"
      onChange="handle()" />
    <input type="text" name="expiry_date" />
    <input type="submit" value="Submit" onClick="verify()" />
  </form>
</html>
<script><[[CDATA[
  function handle() {
    if (get_card_info.card_type.value == "amex") {
      if (get_card_info.card_num.length != 15) {
        alert ("amex should have 15 digits");
      } else {
        if (get_card_info.card_num.length != 16) {
          alert ("visa and master should have 16 digits");
        }
      }
    }
    function verify() {
      var flag = window.confirm("submit the credit card info?");
      if (flag) {
        get_card_info.submit();
      }
    }
  }
  ]]>
</script>
</html>

```

FIG. 7

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```

270 <html>
    <form id="get_card_info" method="post" action="http://payment.asp">
        <select name="card_type" onClick="talk(g_card_types)">
            <option value="amex">American Express</option>
            <option value="visa">Visa</option>
            <option value="ms">MasterCard</option>
        </select>
        <reco id="g_card_types" onReco ="handle()" >
290     < grammar src = ". / gram # card_types " />
        </reco >
        <input type="text" name="card_num" width="30"
            onClick="talk(g_card_num)" />
        <reco id="g_card_num" onReco ="handle()" >
            < grammar src = ". / gram # digits " />
        </reco >
        <input type="text" name="expiry_date"
            onClick="talk(g_expiry_date)" />
        <reco id="g_expiry_date" >
            < grammar src = ". / gram # dates " />
        </reco >
        <input type="submit" value="Submit" onClick="verify()" />
    </form>
    <script><![CDATA[
        function talk(gobj) {
            gobj.activate();
        }
        function handle() {
            if (get_card_info.card_num != null) {
                if (get_card_info.card_type.value == "amex") {
                    if (get_card_info.card_num.length != 15)
                        alert ("amex should have 15 digits");
                } else
                    if (get_card_info.card_num.length != 16)
                        alert ("visa and master should have 16 digits");
            }
        }
        function verify() {
            var flag = window.confirm("submit the credit card
            info?");
            if (flag) {
                get_card_info.submit();
            }
        }
    ]]>
    </script>
</html>

```

FIG. 8

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```

< body >
  < form id = " get_card_info " method = " post " action = " http://payment.asp "
    onActivate = " waiicom() ">
    < prompt id = " p_welcome "> We now need your credit card </ prompt >
    < prompt id = " p_mumble "> I didn't understand you </ prompt >
    < prompt id = " p_card_type " bargain = " true "> What credit card would you
300 use? </ prompt >
    < prompt id = " p_card_num " bargain = " true "> Please say the number " </ prompt >
    < prompt id = " p_expiry_date " bargain = " true "> What is the expiration
303 data? </ prompt >
    < prompt id = " p_content ">
      I have your < value select = " card_type " /> < value select = " card_num " />
      with expiration date
      < value select = " expiry_date " />
    </ prompt >
    < prompt id = " p_confirm "> Is this correct? </ prompt >
    < reco id = " g_card_types " onNoReco = " mumble(this, 2) ">
      onReco = " _handle(this, card_type) " />
    < grammar src = " ./gram#card_types "
    </ reco >
    < reco id = " g_card_num " onNoReco = " mumble(this, 1) ">
      onReco = " _handle(this, card_num) " />
    < grammar src = " ./gram#digits " />
    </ reco >
    < reco id = " g_expiry_date " onNoReco = " mumble(this, 1) ">
      onReco = " _handle(this, expiry_date) " audio = " rao " />
    < grammar src = " ./gram#dates " />
    </ reco >
    < reco id = " confirmation " onReco = " confirmed(this) " />
    < grammar src = " ./gram#yosno " />
    </ reco >
    < select name = " " >
      < option value = " " > American Express </ option >
      < option value = " visa " > Visa </ option >
      < option value = " mc " > MasterCard </ option >
    </ select >
    < input type = " text " name = " card_num " width = " 30 " />
    < input type = " text " name = " expiry_date " />
    < input type = " submit " value = " Submit " />
  </ form >
  < script > <![CDATA[
    function welcome() {
      p_welcome.active();
      repeat = 0;
      checkFilled();
    }
    function mumble(gobj, maxprompts) {
      gobj.deactivate();
      p_mumble.active();
      checkFilled();
    }
  ]]>

```

TO FIG. 9B

FIG. 9A

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```
function handle() {  
  handle();  
  checkFilled();  
}  
function checkFilled() {  
  if (card_type.value == "") {  
    p_card_type.activate();  
    g_card_types.activate(); return;  
  }  
  if (card_num.value == "") {  
    p_card_num.activate(); g_card_num.activate(); return;  
  }  
  if (expiry_date.value == "") {  
    p_expiry_data.activate(); g_expiry_date.activate(); return;  
  }  
  p_content.activate();  
  p_confirm.activate();  
  confirmation.activate();  
}  
  
function confirmed(gobj) {  
  if (gobj.recogRes.text == "yes")  
    get_card_info.submit();  
}  
//  
// user codes start here  
//  
function handle() {  
  if (get_card_info.card_type == "amex") {  
    if (get_card_info.card_num.length != 15) {  
      prompt.speak("amex should have 15 digits");  
      get_card_info.card_num = "";  
    }  
  } else  
    if (get_card_info.card_num.length != 16) {  
      prompt.speak("visa and master should have 16 digits");  
      get_card_info.card_num = "";  
    }  
  }  
}  
]]>  
</script>  
</body>
```

FIG. 9B

```

<body>
  <form id="get_card_info" method="post" action="http://payment.asp"
    onactive="welcome()">
    <prompt id="p_welcome">We may need your credit card</prompt>
    <prompt id="p_mum">I understand you</prompt>
    <prompt id="p_card_type" bargein="true">What credit card would you
use?</prompt>
    <prompt id="p_card_num" bargein="true">Please say the number</prompt>
    <prompt id="p_expiry_date" bargein="true">What is the expiration
date?</prompt>
    <prompt id="p_content">
      I have your <value select="card_type" /> <value select="card_num" />
with expiration date <value select="expiry_date" />
    </prompt>
    <prompt id="p_confirm">Is that correct?</prompt>
    <reco id="g_get_card" src="gram/getPayment" onNoReco="mumble(this)">
      <grammar src="gram/getPayment" />
      <bind target="card_type" value="/card/type" />
      <bind target="card_num" value="/card/number" />
405 — <bind target="expiry_date" value="/card/expr_date" />
    </reco>
    <reco id="confirmation" onReco="confirmed(this)" onNoReco="mumble(this)" />
      <grammar src="gram/yesno" />
    </reco>
    <select name="card_type">
      <option value="amex">American Express</option>
      <option value="visa">Visa</option>
      <option value="ms">MasterCard</option>
    </select>
    <input type="text" name="card_num" width="30" />
    <input type="text" name="expiry_date" />
    <input type="submit" value="Submit" />
  </form>
  <script><!-- ATA[
  function welcome() {
    p_welcome.active();
    repeat = 0;
    checkFilled();
  }
  function mumble(gobj) {
    gobj.deactivate();
    p_mumble.active();
    checkFilled();
  }
  function _handle() {
    handle();
    checkFilled();
  }
  </script>

```

FIG. 10A

↓

TO FIG. 10B

↓

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```

function checkFilled() {
  if (card_type.value == "") {
    p_card_type.activate(); do_field.activate(); return;
  }
  if (card_num.value == "") {
    p_card_num.activate(); do_field.activate(); return;
  }
  if (expiry_date.value == "") {
    p_expiry_data.activate(); do_field.activate(); return;
  }
  p_content.activate();
  p_confirm.activate();
  confirmation.activate();
}
function confirmed(gobj) {
  if (gobj.recogRes.text == "yes")
    get_card_info.submit(gensml());
}
//
// user codes start here
//
function handle() {
  if (field == get_card_info.card_num) {
    if (get_card_info.card_num.length != 15) {
      prompt.speak("amex should have 15 digits");
      get_card_info.card_num = "";
    }
  } else
    if (get_card_info.card_num.length != 16) {
      prompt.speak("visa should have 16 digits");
      get_card_info.card_num = "";
    }
  }
}
function gensml() {
  str = "<smi><credit_card type=";
  str += card_type.value; str += "><number>";
  str += card_number.value; str += "</number><expire>";
  str += expiry_date.value; str +=
  "</expire></credit_card></smi>";
  return str;
}
}}>
</script>
</body>

```

FIG. 10B

SAMPLE ASP+ PAGE

```

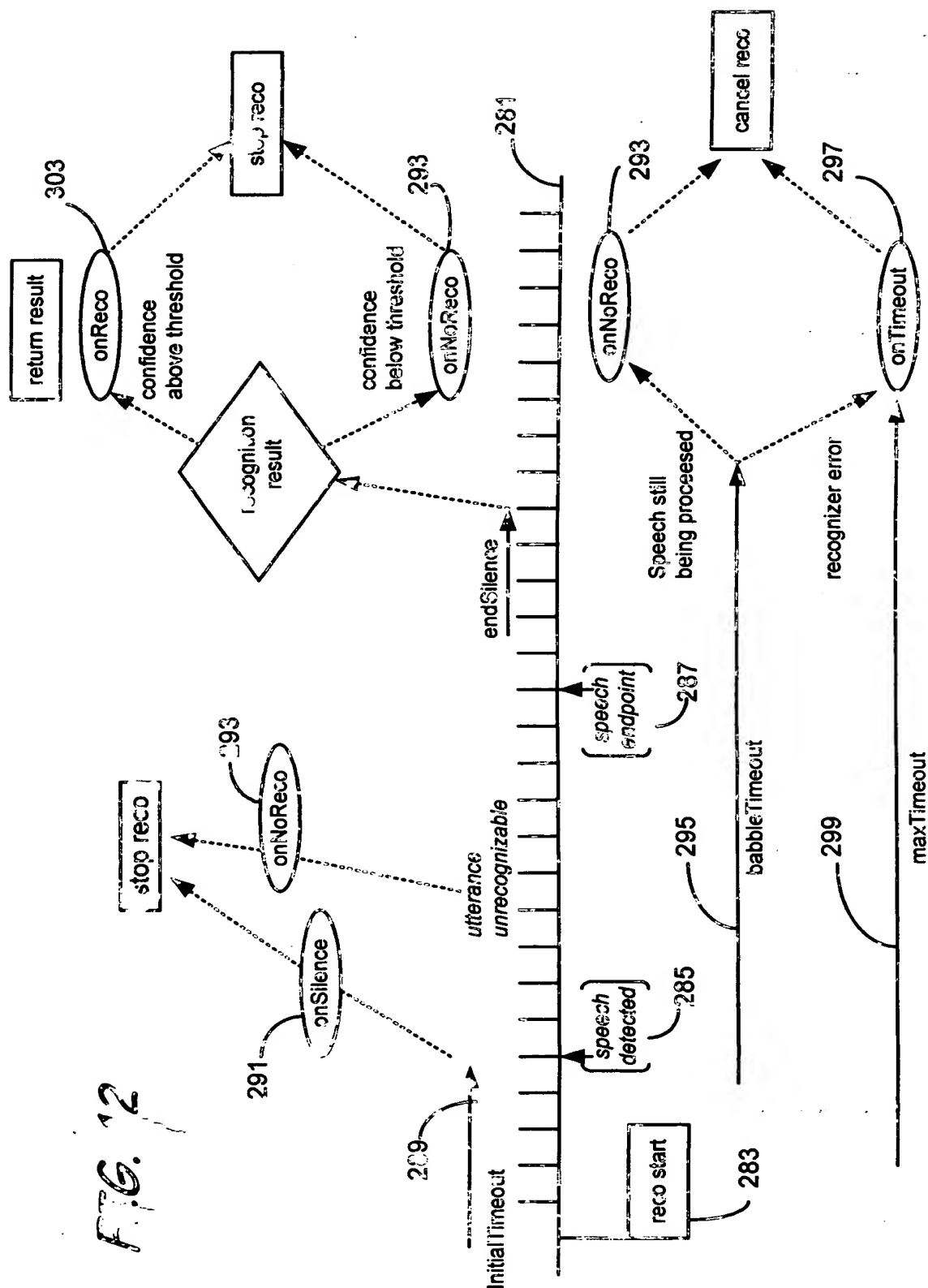
<% Page language="Jscript" AutoEventWireup="false" Inherits="Credit.Transaction" %>
<html><head>
<!-- ASPX page for both voice-only & multimodal credit card example -->
<script>
function handle() {
    if (field == get_card_info.card_num) {
        if (get_card_info.card_num.length != 15) {
            prompt.speak ("amex should have 15 digits");
            get_card_info.card_num = "";
        }
    } else
        if (get_card_info.card_num.length != 16) {
            prompt.speak ("visa should have 15 digits");
            get_card_info.card_num = "";
        }
    }

function gensml() {
    str = '<sml><credit_card><card_type>';
    str += card_type.value; str += '</card_type><number>';
    str += card_number.value; str += '</number><expire>';
    str += expiry_date.value; str += '</expire></credit_card></sml>';
    return str;
}
</script>
<script runat="server">
function Page_Load (obj, args) {
    if (PostBack) {
        validator = new System.Speech.SMLValidator("./CreditSDL.xml");
        dsml = validator.Evaluate(args);
        Navigate(ChoosePage(dsml));
    } else {
        // initialize fields with args
    }
}
</script>
</head>
<body>
<speech:form id="get_card_info" style="system_initiative"
    prompt="./prompt/getPayment" onsubmit="gensml()">
    <speech:choice name="card_type" prompt="What credit card would you use?"
        grammar="./gram#card_types" onPhraseFinish="handle()"
        <option>American Express</option>
        <option>Visa</option>
        <option>Mastercard </option>
    </speech:choice>
    <speech:textbox name="card_number" prompt="Please say the number"
        grammar="./gram#digits" onPhraseFinish="handle()">
    <speech:textbox name="expiry_date" prompt="What is the expiration date?"
        grammar="./gram#dates" onPhraseFinish="handle()">

</speech:form>
</body>
</html>

```

FIG. 11



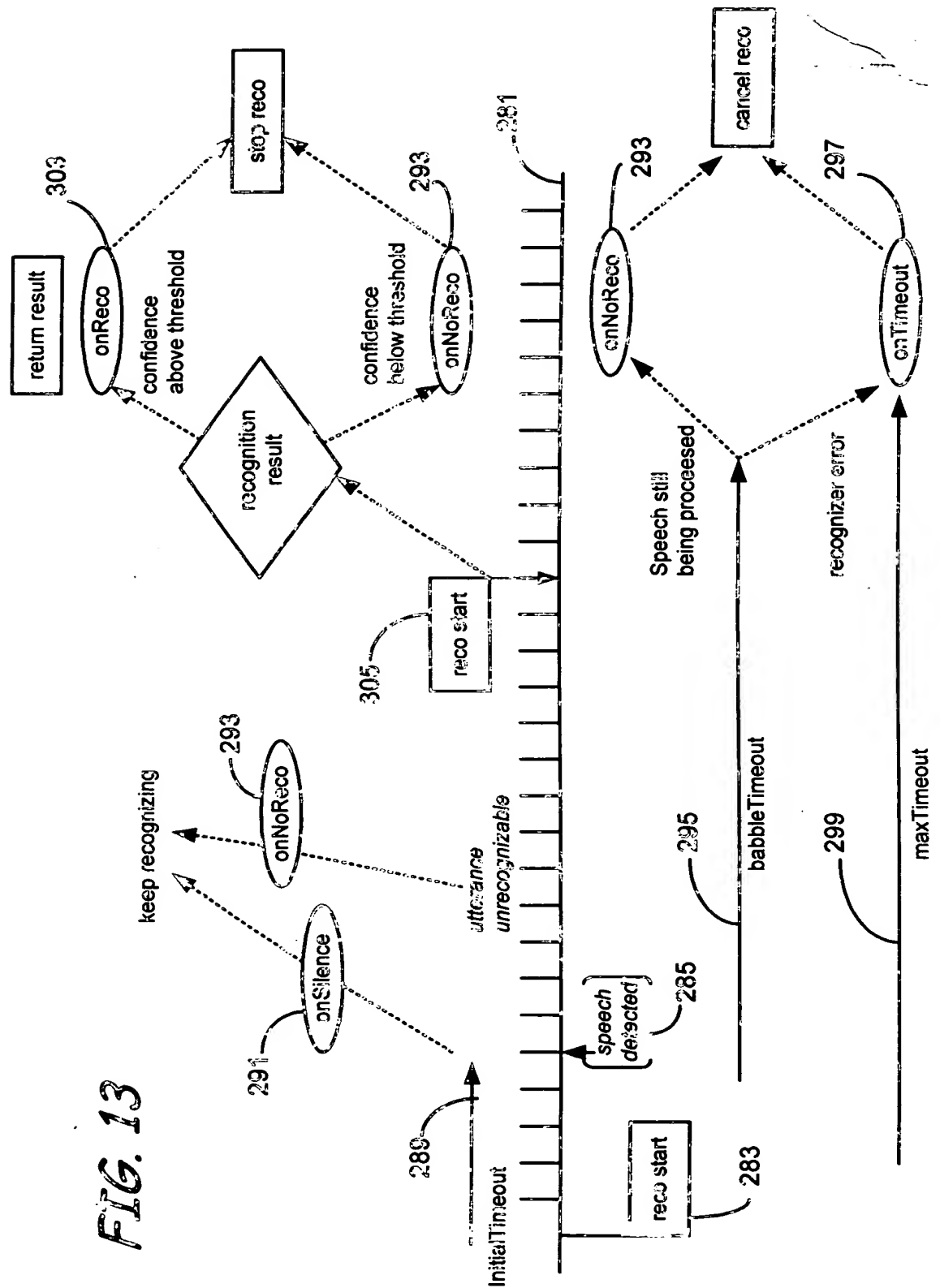


FIG. 14

